PATENT
Atty Dkt No. 135255 (553-1036)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Anders Herman Torp, et al.	:	
	:	Art Unit:
Serial No.: 10/822,935	:	
	:	Examiner:
Filed: April 13, 2004	:	
	:	
For: METHOD AND APPARATUS FOR DETECTING ANATOMIC STRUCTURES	:	
	:	

RESPONSE TO NOTIFICATION OF NON-COMPLIANT APPEAL BRIEF

Mail Stop: APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

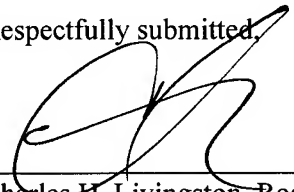
Sir:

In response to the Notification of Non-Compliant Appeal Brief dated December 30, 2008, Applicant hereby submits an amended Summary of Claimed Subject Matter and Claims Appendix in order to:

- Provide the Appeal Brief with a correct copy of the appealed claims as an appendix thereto (37 CFR 41.37(c)(1)(viii).

The Commissioner is hereby also authorized to charge any additional fees or credit any overpayment to Deposit Account Number 50-3858. No new matter has been added.

Respectfully submitted,



Charles H. Livingston, Registration No. 53,933
THE SMALL PATENT LAW GROUP
225 s. Meramec, Suite 725
St. Louis, MO 63105
(314) 584-4089

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,935	04/13/2004	Anders Herman Torp	135255 (553-1036)	4447

45436 7590 12/30/2008

DEAN D. SMALL
THE SMALL PATENT LAW GROUP LLP
225 S. MERAMEC, STE. 725T
ST. LOUIS, MO 63105

EXAMINER	
ART UNIT	PAPER NUMBER

DATE MAILED: 12/30/2008

Please find below and/or attached an Office communication concerning this application or proceeding.

Non-Compliant Appeal Brief
due 01-30-09

Date docketed: 01-05-09
Response Needed: Ref. Non-Compliant Appeal Brief
Initial Due Date: 01-30-09
Last Due Date:
Docketed by: [redacted]

Date Received

JAN 0 5 2009

The Small Patent Law Group LLP

Notification of Non-Compliant Appeal Brief (37 CFR 41.37)	Application No.	Applicant(s)	
	10/822,935	TORP ET AL.	
	Examiner	Art Unit	
	LAWRENCE LARYEA	3768	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

The Appeal Brief filed on *26 November 2008* is defective for failure to comply with one or more provisions of 37 CFR 41.37.

To avoid dismissal of the appeal, applicant must file anamended brief or other appropriate correction (see MPEP 1205.03) within **ONE MONTH or THIRTY DAYS** from the mailing date of this Notification, whichever is longer. **EXTENSIONS OF THIS TIME PERIOD MAY BE GRANTED UNDER 37 CFR 1.136.**

1. ☐ The brief does not contain the items required under 37 CFR 41.37(c), or the items are not under the proper heading or in the proper order.

2. ☐ The brief does not contain a statement of the status of all claims, (e.g., rejected, allowed, withdrawn, objected to, canceled), or does not identify the appealed claims (37 CFR 41.37(c)(1)(iii)).

3. ☐ At least one amendment has been filed subsequent to the final rejection, and the brief does not contain a statement of the status of each such amendment (37 CFR 41.37(c)(1)(iv)).

4. ☐ (a) The brief does not contain a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number and to the drawings, if any, by reference characters; and/or (b) the brief fails to: (1) identify, for each independent claim involved in the appeal and for each dependent claim argued separately, every means plus function and step plus function under 35 U.S.C. 112, sixth paragraph, and/or (2) set forth the structure, material, or acts described in the specification as corresponding to each claimed function with reference to the specification by page and line number, and to the drawings, if any, by reference characters (37 CFR 41.37(c)(1)(v)).

5. ☐ The brief does not contain a concise statement of each ground of rejection presented for review (37 CFR 41.37(c)(1)(vi))

6. ☐ The brief does not present an argument under a separate heading for each ground of rejection on appeal (37 CFR 41.37(c)(1)(vii)).

7. ☒ The brief does not contain a correct copy of the appealed claims as an appendix thereto (37 CFR 41.37(c)(1)(viii)).

8. ☐ The brief does not contain copies of the evidence submitted under 37 CFR 1.130, 1.131, or 1.132 or of any other evidence entered by the examiner **and relied upon by appellant in the appeal**, along with a statement setting forth where in the record that evidence was entered by the examiner, as an appendix thereto (37 CFR 41.37(c)(1)(ix)).

9. ☐ The brief does not contain copies of the decisions rendered by a court or the Board in the proceeding identified in the Related Appeals and Interferences section of the brief as an appendix thereto (37 CFR 41.37(c)(1)(x)).

10. ☐ Other (including any explanation in support of the above items):

7. Claims appendix is missing claim 17. Claim18 has been written as independent. Claims should be consistent with the last entered amednment.

The entire brief is not required only the section found defctive.

Tracey M Young/Tracey M Young/
Patent Appeal Specialist

V. SUMMARY OF CLAIMED SUBJECT MATTER

The following summary does not limit, in any manner whatsoever, the claim interpretation. Rather, the following summary is provided only to facilitate the Board's understanding of the subject matter of this appeal.

Various embodiments of the invention relate to methods for detecting an anatomic structure based on a medical diagnostic imaging data set, systems for identifying an endocardium, and methods for identifying at least one of a contour between different types of tissue and a contour between tissue and blood. More specifically, the invention is defined claim-by-claim as set forth below.

Independent claim 1 recites a method for detecting an anatomic structure based on a medical diagnostic imaging data set (page 7, paragraph 27 of the specification and Figure 4). The method comprises obtaining 160 a data set 150 representative of a diagnostic image corresponding to an anatomic structure (page 7, paragraph 27 of the specification and Figure 4). The method also includes identifying 162 and 164 at least one anatomic landmark 152, 154, and 156 within the data set 150 (page 7, paragraph 28 of the specification and Figure 4). The method also includes overlaying 170 the data set 150 with a contour template 190 (page 8, paragraphs 29 and 30 of the specification and Figures 4 and 5). The method also includes analyzing 172-178 a search region 168 of the data set 150 surrounding the contour template 190 to identify transition points 270-308 associated with a predefined characteristic of the anatomic structure and based at least on a transition smoothness (pages 8-10, paragraphs 31-38 of the specification and Figures 4, 6, and 7).

Claim 2 depends from claim 1 and further recites that the method further comprises defining contours 310 for a series of images based on the contour template 190 and the transition points 270-308 and comparing the contours 310 for adjacent images (pages 11-13, paragraphs 42-46 of the specification and Figures 4 and 9).

Claim 3 depends from claim 1 and further recites that the predefined characteristic of the anatomic structure is an interior edge of a chamber of the heart (pages 1, 5, 7, and 13, paragraphs

2, 23, 27, and 47 of the specification and Figure 3).

Claim 4 depends from claim 1 and further recites that the predefined characteristic of the anatomic structure is a wall of a chamber of the heart (pages 1, 5, 7, and 13, paragraphs 2, 23, 27, and 47 of the specification and Figures 4 and 9).

Claim 5 depends from claim 1 and further recites that the method further comprises defining 172 a series of paths 202-210 traversing the contour template 190, along which the analyzing 176 is performed (pages 8 and 9, paragraphs 31 and 33 of the specification and Figures 4-6.

Claim 6 depends from claim 1 and further recites that the method further comprises defining 172 a series of paths 202-210 orthogonal to the contour template 190 and searching 174 for candidate transition points 212-216 along the paths 202-210 (page 8, paragraphs 31 and 32 of the specification and Figures 4-6).

Claim 7 depends from claim 1 and further recites that the method further comprises scoring 176 candidate transition points 212-216 within the search region 168 based on at least one of a change in brightness, a smooth spatial transition between adjacent transition points in a diagnostic image, and a smooth temporal transition between corresponding transition points in other diagnostic images (pages 8 and 9, paragraph 33 of the specification and Figure 4).

Claim 8 depends from claim 1 and further recites that the method further comprises selecting 178 a path through candidate transition points 212-216 in the search region 168 based on transition smoothness (pages 9 and 10, paragraphs 35-42 of the specification and Figures 4 and 9).

Claim 9 depends from claim 1 and further recites that the contour template 190 estimates an outline of anatomic structure (page 8, paragraph 30 of the specification and Figure 5).

Claim 10 depends from claim 1 and further recites that obtaining 160 includes performing at least one of an ultrasound, CT, PET, SPECT, Gamma Camera, X-ray, and MR scan of an anatomy of interest (pages 5 and 7, paragraphs 23 and 27 of the specification and Figure 4).

Claim 11 depends from claim 1 and further recites that obtaining 160 includes loading a previously acquired data set (page 7, paragraph 27 of the specification and Figure 4).

Claim 12 depends from claim 1 and further recites that the anatomic structure constitutes the endocardium and the anatomic landmark constitutes at least one of a ventricle apex 152, a plane separating an atrium and ventricle, and a cardiac valve (page 7, paragraphs 27 and 28 of the specification and Figure 4).

Independent claim 13 recites a system 100 for identifying an endocardium (pages 4 and 5, paragraphs 18-22 of the specification and Figures 1 and 2). The system 100 comprises a transmitter 102 and 12 for transmitting ultrasound signals into an area of interest (pages 4 and 5, paragraphs 18 and 21 of the specification and Figures 1 and 2). The system 100 also comprises a receiver 108 and 14 for receiving echo signals from transmitted ultrasound signals (pages 4 and 5, paragraphs 18 and 21 of the specification and Figures 1 and 2). The system 100 also includes a memory 122 and 20 for storing a series of image frames 150 comprising the echo signals, wherein the series of image frames 150 comprising at least one heart cycle (pages 4-6, paragraphs 20, 21, and 24 of the specification and Figures 1 and 2). The system 100 also includes a signal processor 116 processing the series of image frames to identify 162 and 164 at least one of an apex 152 and an AV plane 154 and 156 having first and second ends (pages 6 and 7, paragraphs 24 and 28 of the specification and Figures 1, 3, and 4). The signal processor 116 overlays 170 a contour template 190 connecting the apex 152 to the first and second ends 154 and 156, respectively, on the series of image frames 150 (page 8, paragraphs 29 and 30 of the specification and Figures 4 and 5). The signal processor 116 identifies and compares points 192-200 along the contour template 190 to identify transition points 207-308 based upon a predefined characteristic of an endocardium and a transition smoothness (pages 8-10, paragraphs 31-38 of the specification and Figures 4, 6, and 7). The system 100 comprises an output 118 and 67 for outputting information based on an output of the signal processor 116 (pages 4 and 5, paragraphs 20 and 22 of the specification and Figures 1 and 2).

Claim 14 depends from claim 13 and further recites that the signal processor 116 defines paths 202-210 transverse to the contour template 190 (page 8, paragraph 31 of the specification and Figures 4 and 5). The paths 202-210 intersect the points 192-200 (page 8, paragraph 31 of

the specification and Figures 4 and 5). The signal processor 116 defines at least two candidate points 212-216 along each path 202-210 and compares the at least two candidate points 212-216 to each other with respect to the predefined characteristic (pages 8 and 9, paragraphs 32 and 33 of the specification and Figures 4-6).

Claim 15 depends from claim 13 and further recites that the system 100 further comprises a user input for adjusting at least one of the apex 152 and the first and second ends 154 and 156, respectively, of the AV plane (page 7, paragraph 28 of the specification and Figure 4).

Claim 16 depends from claim 13 and further recites that the signal processor 116 compares the transition points 207-308 in adjacent image frames 150 within the series of image frames 150 (pages 11 and 12, paragraphs 43 and 44 of the specification and Figures 4 and 9). The signal processor 116 moves at least one transition point 207-308 in a first adjacent image frame based upon at least one transition point 207-308 in at least one adjacent image frame (pages 11 and 12, paragraph 44 of the specification and Figures 4 and 9).

Independent claim 17 recites a method for identifying at least one of a contour between different types of tissue and a contour between tissue and blood (page 7, paragraph 27 of the specification and Figure 4). The method comprises obtaining 160 a series of data sets 150 representative of a diagnostic image having at least two different types of tissue (page 7, paragraph 27 of the specification and Figure 4). The method also includes identifying 162 and 164 at least two anatomic landmarks 152, 154, and 156 within the series of data sets (page 7, paragraph 28 of the specification and Figure 4). The method also includes connecting 170 and 172 at least two anatomic landmarks 152, 154, and 156 with a contour template 190 (page 8, paragraphs 29-31 of the specification and Figures 4 and 5). The method also includes identifying 174 data points 212-216 on and around the contour template 190 (page 8, paragraph 32 of the specification and Figures 4 and 5). The method also includes comparing 176 and 178 the data points 212-216 to identify transition points 207-308 having a predefined characteristic indicative of a change from one type of tissue to one of a second type of tissue and blood, and a transition smoothness (pages 8-10, paragraphs 31-38 of the specification and Figures 4, 6, and 7).

Claim 18 depends from claim 17 and further recites that the method further comprises

identifying multiple corresponding transition points 207-308 on adjacent data sets within the series of data sets 150 (pages 11 and 12, paragraphs 43 and 44 of the specification and Figures 4 and 9). The method also comprises adjusting a location of a corresponding transition point 207-308 based upon an average of the multiple corresponding transition points 207-308 (pages 11 and 12, paragraph 44 of the specification and Figures 4 and 9).

Claim 19 depends from claim 17 and further recites that identifying 174 data points 212-216 further comprises defining paths 202-210 being transverse with respect to the contour template 190, wherein the data points 212-216 are identified along the paths 202-210 (page 8, paragraphs 31 and 32 of the specification and Figures 4-6). Comparing 176 and 178 further comprises comparing the data points 212-216 located along multiple paths 202-210 (pages 8-10, paragraphs 31-38 of the specification and Figures 4-7). The method further comprise adjusting a location of at least one transition point 207-308 based upon an output of the comparing 176 and 178 (pages 9 and 10, paragraphs 36 and 37 of the specification and Figures 4-7).

Claim 20 depends from claim 17 and further recites that identifying 174 data points 212-216 further comprises defining paths 202-210 being transverse with respect to the contour template 190, wherein the data points 212-216 are identified along the paths 202-120 (page 8, paragraph 31 of the specification and Figures 4-6). Comparing 176 and 178 further comprises comparing the data points 212-216 located along the same path 202-210 (page 8, paragraph 32 of the specification and Figures 4-6). The method further comprises assigning a score to each data point 212-216 based on an output of the comparing 176 and 178 (pages 8 and 9, paragraph 33 of the specification and Figures 4-6).

Claim 21 depends from claim 17 and further recites that identifying 174 data points 212-216 further comprises defining paths 202-210 being transverse with respect to the contour template 190, wherein the data points 212-216 are identified along the paths 202-212 (page 8, paragraph 31 of the specification and Figures 4-6). Comparing 176 and 178 further comprises comparing the data points 212-216 located along a first set of adjacent paths 202-210 (pages 8-10, paragraphs 31-38 of the specification and Figures 4-7). The method further comprises adjusting a location of at least one transition point 207-308 based upon an output of the comparing 176 and 178 (pages 9 and 10, paragraphs 36 and 37 of the specification and Figures

4-79). Comparing 176 and 178 further comprises comparing the data points 212-216 located along a second set of adjacent paths 202-212, wherein the first and second sets comprise at least one common path 202-212, and wherein the data points 212-216 include at least one transition point 207-308 previously adjusted (pages 9 and 10, paragraphs 35-38 of the specification and Figures 4-7).

VIII. CLAIMS APPENDIX

1. A method for detecting an anatomic structure based on a medical diagnostic imaging data set, comprising:

obtaining a data set representative of a diagnostic image corresponding to an anatomic structure;

identifying at least one anatomic landmark within said data set;

overlaying said data set with a contour template; and

analyzing a search region of said data set surrounding said contour template to identify transition points associated with a predefined characteristic of the anatomic structure and based at least on a transition smoothness.

2. The method of claim 1, further comprising defining contours for a series of images based on said contour template and said transition points and comparing said contours for adjacent images.

3. The method of claim 1, wherein said predefined characteristic of the anatomic structure is an interior edge of a chamber of the heart.

4. The method of claim 1, wherein said predefined characteristic of the anatomic structure is a wall of a chamber of the heart.

5. The method of claim 1, further comprising defining a series of paths traversing said contour template, along which said analyzing is performed.

6. The method of claim 1, further comprising defining a series of paths orthogonal to said contour template and searching for candidate transition points along said paths.

7. The method of claim 1, further comprising scoring candidate transition points within said search region based on at least one of a change in brightness, a smooth spatial transition

between adjacent transition points in a diagnostic image, and a smooth temporal transition between corresponding transition points in other diagnostic images.

8. The method of claim 1, further comprising selecting a path through candidate transition points in said search region based on transition smoothness.

9. The method of claim 1, wherein said contour template estimates an outline of anatomic structure.

10. The method of claim 1, wherein said obtaining includes performing at least one of an ultrasound, CT, PET, SPECT, Gamma Camera, X-ray, and MR scan of an anatomy of interest.

11. The method of claim 1, wherein said obtaining includes loading a previously acquired data set.

12. The method of claim 1, wherein said anatomic structure constitutes the endocardium and said anatomic landmark constitutes at least one of a ventricle apex, a plane separating an atrium and ventricle, and a cardiac valve.

13. A system for identifying an endocardium, comprising:

a transmitter for transmitting ultrasound signals into an area of interest;

a receiver for receiving echo signals from transmitted ultrasound signals;

a memory for storing a series of image frames comprising said echo signals, said series of image frames comprising at least one heart cycle;

a signal processor processing said series of image frames to identify at least one of an apex and an AV plane having first and second ends, said signal processor overlaying a contour template connecting said apex to said first and second ends on said series of image frames, said signal processor identifying and comparing points along said contour template to identify transition points based upon a predefined characteristic of an endocardium and a transition smoothness; and

an output for outputting information based on an output of said signal processor.

14. The system of claim 13, further comprising said signal processor defining paths transverse to said contour template, said paths intersecting said points, said signal processor defining at least two candidate points along each said path and comparing said at least two candidate points to each other with respect to said predefined characteristic.

15. The system of claim 13, further comprising a user input for adjusting at least one of said apex and said first and second ends of said AV plane.

16. The system of claim 13, further comprising said signal processor comparing said transition points in adjacent image frames within said series of image frames, said signal processor moving at least one said transition point in a first adjacent image frame based upon at least one transition point in at least one adjacent image frame.

17. A method for identifying at least one of a contour between different types of tissue and a contour between tissue and blood, said method comprising:

obtaining a series of data sets representative of a diagnostic image having at least two different types of tissue;

identifying at least two anatomic landmarks within said series of data sets;

connecting said at least two anatomic landmarks with a contour template;

identifying data points on and around said contour template; and

comparing said data points to identify transition points having a predefined characteristic indicative of a change from one type of tissue to one of a second type of tissue and blood, and a transition smoothness.

18. The method of claim 17, further comprising:

identifying multiple corresponding transition points on adjacent data sets within said series of data sets; and

adjusting a location of a corresponding transition point based upon an average of said multiple corresponding transition points.

19. The method of claim 17, further comprising:

said identifying data points further comprising defining paths being transverse with

respect to said contour template, said data points being identified along said paths;

said comparing further comprising comparing said data points located along multiple said paths; and

adjusting a location of at least one said transition point based upon an output of said comparing.

20. The method of claim 17, further comprising:

said identifying data points further comprising defining paths being transverse with respect to said contour template, said data points being identified along said paths;

said comparing further comprising comparing said data points located along the same said path; and

assigning a score to each said data point based on an output of said comparing.

21. The method of claim 17, further comprising:

said identifying data points further comprising defining paths being transverse with respect to said contour template, said data points being identified along said paths;

said comparing further comprising comparing said data points located along a first set of adjacent paths;

adjusting a location of at least one said transition point based upon an output of said comparing; and

said comparing further comprising comparing said data points located along a second set of adjacent paths, said first and second sets comprising at least one common path, said data points including at least one said transition point previously adjusted.